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Web cache coherence

Adam Dingle[a], ✉, 🔲 and Tomáš Pártl[b], 🔲
[a]KSVI, Charles University, Prague, Czech Republic
[b]FJFI, Czech Technical University, Prague, Czech Republic

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Abstract

All Web caches must try to keep cached pages up to date with the master copies of those pages, to avoid returning stale pages to users. In traditional distributed systems terminology, the problem of keeping cached pages up to date is called *coherence*. We discuss the coherence problem for Web caches, and argue that coherence techniques used for distributed file system caches may not be satisfactory for Web caches. We survey techniques used by popular Web caches for maintaining coherence, including the popular "expiration mechanism" which probably originated in CERN's proxy http server. We discuss a number of problems with the existing expiration mechanism, and present several extensions to it which solve these problems, reduce user wait times and decrease the staleness of returned Web pages. We also discuss *pre-fetching* and *replication*, more speculative techniques for keeping Web caches up to date.

Keywords: Cache; HTTP; Proxy; Coherence

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Corresponding author.

Vitae

Adam Dingle earned a B.S.E. in Computer Science from Princeton University in 1990 and a M.S. in Computer Science from the University of California at Berkeley in 1992. Since 1994 he has taught computer science at Charles University in Prague. His interests in computer science include programming languages, distributed systems and networks, especially the Internet. His research presently focuses on distributed caching for the World Wide Web.

Tomáš Pártl was born on May 27, 1974 in Prague. In 1992, he graduated from Southwestern Academy in San Marino, CA. Presently he is a fourth year computer major at the Faculty of Nuclear and Physical Engineering of The Czech Technical University.